Fermentative behavior of Saccharomyces strains during microvinification of raspberry (*Rubus idaeus*)

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The fermentation process for elaboration of the beverage depends on the performance of yeast to convert the sugars into alcohol, esters and other compounds. Due to the differences in fruit composition, selected yeasts strains used for fermentation have to adapt to different environments (e.g., sugar composition and concentrations, presence of organic acids, etc.). Sixteen different yeasts (*S. cerevisiae* and *S. bayanus*) were evaluated in the production of raspberry fruit wine. Raspberry pulp was diluted with a sucrose solution to adjust the sugar concentration to 16° Brix. $CaCO_3$ was added to increase the pH value to 4.0. Batch fermentations were carried out at 22 °C. Kinetic parameters, as conversion factors of substrate into ethanol ($Y_{p/s}$), biomass ($Y_{x/s}$), glycerol ($Y_{g/s}$), acetic acid ($Y_{ac/s}$) and efficiency (E_f) were calculated. Volatile compounds (alcohols, esters, acetates and acids) were determined by gas chromatography (GC-FID) after liquid-liquid extraction with dichloromethane. The parameters E_f, $Y_{p/s}$, $Y_{g/s}$ and $Y_{x/s}$, were found in high levels when yeasts commonly used in fuel ethanol industry (PE-2, BG, SA, CAT-1 e VR-1) fermented raspberry pulp. Yeast UFLA FW 15, isolated from fruit, showed similar results. Twenty-two volatile organic compounds (VOCs) were identified in raspberry fruit wines. The highest total concentration of VOCs were found for the yeasts UFLA FW 15 (87662.00 μg L^{-1}), CAT-1 (80451.33 μg L^{-1}), *S. bayanus* CBS 1505 (71761.00 μg L^{-1}) and VR-1 (67670.33 μg L^{-1}). In the ethyl esters group, the highest concentrations were 454.33 μg L^{-1}, 440.33 μg L^{-1} and 438 μg L^{-1} for UFLA FW 15, VR-1 and BG, respectively. As for ethyl esters, the raspberry fruit wine fermented with UFLA FW 15 showed the highest concentrations of acetates (1927.67 μg L^{-1}) and higher alcohols (83996.33 μg L^{-1}). The maximum concentration of acids was found in the raspberry fruit wine produced with yeast VR-1. It can be concluded that UFLA FW 15 was able to ferment the raspberry pulp and produce a fruit wine with low concentration of acids, high concentrations of acetates, higher alcohols and ethyl esters.

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